

REMARKS

The corrective amendments suggested for claim 9 are being made. It is appreciated that the Office Action pointed out these errors so they could be corrected.

The allowance of claims 5 – 8 and 14 – 17 is noted with appreciation. Claims 11 – 13 are being cancelled.

Reconsideration is respectfully requested of the rejection of claims 1, 4, 9 and 10 under 35 U.S.C. §103(a) over United States patents nos. 5,714,909 (“Jackson”) and 5,612,810 (“Inami et al.”). As pointed out in the Office Action, the Jackson reference discloses an infrared transceiver without disclosure of the claimed current amplification stages. The Inami et al. reference is cited for disclosing current amplification stages. But this disclosure has not been found. Rather, it appears that Inami et al. discloses multiple voltage amplifier stages. The amplifier stages 30 and 70 (Figure 9) that are referenced in the Office Action are clearly voltage signal amplifiers. The current signal from the photodetector 10 is immediately converted by the pre-amplifier stage 20 into a voltage signal, and it is that voltage signal that is subsequently amplified by the stages 30 and 70. Note, for example, that the waveforms of Figure 8 for the circuit embodiment of Figure 7 (which includes the pre-amplifier 20 and the amplifier 30) are all of voltage waveforms. There are no current signals to be referenced.

Therefore, an addition of the amplifier stages of Inami et al. into the system of Jackson would cause voltage amplification of the signals, not the current amplification that is claimed. As described extensively in the present application specification, amplifying the photodetector current signal in multiple current amplification stages before converting it into a voltage signal has an advantage of improving the signal-to-noise ratio of the resulting voltage signal. It is respectfully suggested that a combination of the Jackson and Inami et al. references does not suggest this.

In addition to the foregoing, dependent claim 10 specifies that the current signals are amplified with a transistor operating in the weak inversion range. Neither the Jackson nor the Inami et al. references cited to reject claim 10 are alleged in the Office Action to suggest this feature, which is also included in other claims rejected over a different combination of references.

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Claim 18 stands rejected over this different combination of references that do not include disclosure of the staged current amplification. Because claim 18 is dependent upon claim 1, is believed to be allowable for the same reasons given above for claim 1.

An early indication of the allowance of the present application is solicited. However, if the Examiner has any further issues that need to be considered, he is invited to telephone the undersigned attorney at 415-217-6293.

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AMENDED CLAIMS WITH MARKINGS TO SHOW CHANGES MADE

9. (Amended Four Times) An improved method for detecting and amplifying incident wireless signals, said method being implemented in an infrared transceiver system comprising a signal detector, a voltage converter and a signal amplifier, said method comprising the steps of:

said signal detector converting said incident wireless signals into electrical current signals; and

said amplifier amplifying said electrical current signals, said amplifying step comprising at least two stages of amplification of said current signals.

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TEXT OF ALL APPLICATION CLAIMS AFTER AMENDMENT

1. (Amended Three Times) An improved infrared transceiver system comprising:
a first sensor for detecting infrared signals incident thereon and converting said signals to an electrical current signal;
a gain controller for amplifying said current signals;
a voltage converter for converting said current signals into voltage signals; and
staged current amplification means in circuit between said gain control means and said voltage conversion means, said staged amplification means comprised of a least two amplification stages, each said stage amplifying said current signals.

4. (Amended Three Times) The system of Claim 1, wherein said gain controller comprises a current mirror in operative connection with said staged current amplification means.

5. (Amended Three Times) An improved infrared transceiver system comprising:
a first sensor for detecting infrared signals incident thereon and converting said signals to an electrical current signal;
a gain controller for amplifying said current signals;
a voltage converter for converting said current signals into voltage signals; and
a staged current amplifier in circuit between said gain controller and said voltage converter, said staged current amplifier comprised of at least two amplification stages, each of said stages amplifying said current signals, wherein said gain controller comprises a current mirror in operative connection with said staged current amplifier and further wherein said staged current amplifier comprises:

a first transistor, said first transistor comprising a first drain and a first gate;
a second transistor, said second transistor comprising a second source and a second drain, said second source being in circuit with said first drain;

a third transistor, said third transistor comprising a third gate and a third source, said third gate being in circuit with said second drain; and

a fourth transistor, said fourth transistor comprising a fourth drain and a fourth gate, said fourth drain in circuit with said fourth gate and said first gate.

6. The system of Claim 5, wherein said current mirror is in circuit with said second drain and said third gate.

7. The system of Claim 5, further comprising an output terminal, said output terminal being in circuit with said third source and said fourth drain.

8. (Twice Amended) The system of Claim 7, wherein each of said transistors comprises a bias voltage, and wherein said bias voltage is dynamically adjustable in order to operate each of said transistors in a weak inversion range.

9. (Amended Four Times) ~~An improved method for detecting and amplifying incident wireless signals, said method being implemented in an infrared transceiver system comprising a signal detector, a voltage converter and a signal amplifier, said method comprising the steps of:~~
said signal detector converting said incident wireless signals into electrical current signals; and
said amplifier amplifying said electrical current signals, said amplifying step comprising at least two stages of amplification of said current signals. →

10. (Amended Three Times) The method of Claim 9, wherein each said stage of said amplifying comprises amplifying said current signals in a transistor operating in the weak inversion range.

14. (Amended Three Times) An improved wireless signal receiver system comprising:

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a first sensor for detecting wireless signals incident thereon and converting said signals to an electrical current signal;
a gain controller for amplifying said current signals; and
a voltage converter for converting said current signals into voltage signals;
wherein said gain controller further comprises a staged current amplifier operating in the weak inversion range, and a current mirror in operative connection with said current amplifier; and wherein said current amplifier comprises:
a first transistor, said first transistor comprising a first drain and a first gate;
a second transistor, said second transistor comprising a second source and a second drain, said second source being in circuit with said first drain;
a third transistor, said third transistor comprising a third gate and a third source, said third gate being in circuit with said second drain; and
a fourth transistor, said fourth transistor comprising a fourth drain and a fourth gate, said fourth drain in circuit with said fourth gate and said first gate.

15. The system of Claim 14, wherein said current mirror is in circuit with said second drain and said third gate.

16. The system of Claim 14, further comprising an output terminal, said output terminal being in circuit with said third source and said fourth drain.

17. (Twice Amended) The system of Claim 16, wherein each of said transistors comprises a bias voltage, and wherein said bias voltage is dynamically adjustable in order to operate each of said transistors in a weak inversion range.

18. The system of Claim 1, wherein each said amplification stage comprises one transistor means, each said transistor means comprising a bias voltage, and wherein said bias voltage is dynamically adjusted in order to operate each said transistor in a weak inversion range.

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